

2/PRTH

531 Rec'd PCT/EP 14 JAN 2002

SUPPORTING PROFILE

The invention relates to a supporting profile for a system for erecting structures, particularly for constructions for fairs, exhibits or stores, which is provided with longitudinally extending grooves on the outside, which grooves are used for the connection of additional supporting profiles or structural parts of the construction system, in the core area, a receiving chamber for a turnbuckle being provided, which receiving chamber is integrated in the first adapter piece which is inserted in guides pointing toward the interior of the supporting profile and is axially held by means of securing devices which are inserted in bores penetrating the guides.

A supporting profile of this type is known from German Patent Document DE-U 298 21 204. This profile is a hollow profile, into which an adapter piece was in each case inserted and axially fastened on the faces, which adapter piece has axially extending chambers for receiving at least one turnbuckle which, in turn, can be utilized for fastening such supporting profiles on the externally extending grooves of additional supporting profiles of the same or a similar type on the face side.

Supporting profiles of this prior art have a relatively low weight because they are provided with the adapter pieces only on their faces and otherwise remain hollow.

For fair and exhibition constructions, optionally also for store constructions, however, structures are often desirable which require an angular arrangement of supporting profiles with respect to one another, which is not

possible in the case of the supporting profile of the above-mentioned type. Other known supporting profiles can also not easily be used for such constructions.

It is therefore an object of the present invention to further develop supporting profiles of the initially mentioned type such that additional usage possibilities exist or that well-designed further developments can be achieved.

For achieving this object, in the case of a supporting profile of the initially mentioned type, it is provided that an end disk, which is adapted to the cross-section of the supporting profile, is provided for being placed on at least one open face of the supporting profile and is connected with the adapter piece. This results in a simple embodiment.

In a further development of the invention, the end disk may be constructed as a formed body with a concave recess which is adapted to the external curvature of a round profile. The face-side mutual connection of round profiles can take place in this manner so that no unattractive gaps remain and without the requirement of cumbersome work for inserting adapting pieces during the assembly. The end disks are fixedly disposed on the face of the assigned supporting profile, and, as a further development of this embodiment, the formed body may also be provided with a passage opening for guiding through a turnbuckle which will then permit the fastening of the supporting profile on the external grooves of another profile. It was found in this case that the turnbuckle, which is axially held in the interior of the supporting profile by the initially also mentioned adapter piece, can also be utilized for holding the end disk on the face of the supporting profile. When the turnbuckle is then placed in

an external groove of another profile, by means of this tensioning operation, the end disk is simultaneously also fixedly clamped in, so that a separate fastening of the end disk on the face will only become necessary when the assigned supporting profile accommodates no turnbuckle.

As a further development of the invention, the end disk may, however, also be provided with a joint part for the connection with additional profiles. The joint part may consist of a disk which extends perpendicular to the end disk and has a center bore and of an additional second disk which is connected with the first disk by means of a bolt acting as an axis of rotation and which is equipped with fastening devices for another profile. This embodiment will then, when the second disk is connected with another end disk, permit the joint-type joining of the faces of two supporting profiles.

When, as a further development of the invention, the second disk is provided with a clamping part for the insertion into one of the longitudinally extending grooves of another supporting profile, this further development will then permit the articulated connection of a supporting profile to the longitudinal side of a first profile.

In order to attractively cover toward the outside the disks serving as a joint, as a further development of the invention, hemispheres can be provided for the lateral covering of the disks, these hemispheres, as a further development of the invention, having a center bore with a thread and by means of this thread being screwable upon a thread at the ends of the bolt penetrating the disks.

The invention is illustrated in the drawing by means of embodiments and will be explained in the following.

Figure 1 is a perspective partial view of further developed supporting profiles according to the invention which are mutually connected by way of a joint;

Figure 2 is an exploded view of the arrangement according to Figure 1;

Figure 3 is a view of one of the end disks used in the embodiment according to Figure 1;

Figure 4 is a face-side view of one of the supporting profiles according to Figures 1 and 2;

Figure 5 is a view of a clamping piece for the connection with an end disk according to Figure 3 for a fastening to an external groove of a supporting profile;

Figure 6 is a view of the insert of the clamping piece of Figure 5 for the articulated arrangement of two profiles;

Figure 7 is a view of the supporting profiles according to the invention similar to Figure 1 but with a square cross-section;

Figure 8 is a representation similar to Figure 6 but with supporting profiles with a square cross-section;

Figure 9 is a perspective partial view of three supporting profiles with a round cross-section which are assembled to form a junction point;

Figure 10 is a schematic sectional view of the junction point according to Figure 9;

Figure 11 is a view of one of the end disks used for assembling the profiles according to Figures 9 and 10; and

Figure 12 is a lateral view of the end disk according to Figure 11.

Figures 1 to 4 show a first embodiment of the invention. Here, two supporting profiles 1 are provided which have a round cross-section and which, on their outer circumference, are provided with longitudinally extending grooves 2 and which, in the area of their open front ends, have a slid-in adapter piece 3 which is held in its axial position by screws 4 laterally inserted in corresponding openings. This adapter piece 3 is utilized for fastening an end disk 5 which is fastened on the face side on the supporting profile 1 by means of screws 6 which engage in the openings 7 of the adapter piece 3. A lug with an end in the shape of a disk 9 is fastened on the end disks 5, in each case projecting perpendicularly from the disk surface, which disk 9, as illustrated particularly in Figure 3, is provided with a center bore 10. A bolt 11, which is provided with a thread at least at one of its two ends, is guided through this center bore 10, which thread has the purpose of connecting the two disk-type ends 9 of both end disks 5 in a mutually rotatable manner, which end disks 5 are each mounted in the above-described manner on the face side on the supporting profiles 1. Nuts 12 hold the two disks 9 against one another. In order to permit a tool-less assembly, instead of the nuts 12, butterfly nuts may be used in this case. The disks are then, for aesthetic reasons, covered toward the outside by means of one hemisphere 13

respectively, which is screwed onto the thread of the respective bolt 11 by means of a thread part 14 provided in the hemisphere 13. The arrangement according to Figure 1 therefore permits the articulated joining of two supporting profiles in each case by the arrangement of end disks in a corresponding further development.

Figures 5 and 6 show a variant of the further development according to Figure 1. Here, the disk 9 of an end disk 5', which in the embodiment according to Figure 6 has a smaller diameter than the end disks 5 of Figures 1 to 4, is connected with a disk body 15 (Figure 5) whose attachment 16 is, however, not fastened to an end disk. On the contrary, the attachment 16 interacts with a clamping piece 17 which, by way of a screw guided through the bores 18 and a pertaining nut 20, is held on the lug 16 so that it can be swivelled away to the side. Two clamping screws 21 are inserted into threaded bores 22 of the clamping piece 17 and can, in each case, press the free edge 17a of the clamping piece away from the free edge 16a which is provided with an elevation projecting toward the outside, so that, as illustrated by Figure 6, the clamping piece is first slid into the open side of the groove 2 and is then laterally spread open, so that the parts 17 and 16 are jammed inside the groove. In the embodiment of Figure 6, the supporting profiles 1 and 1', which have different diameters, can thereby be connected in an articulated manner.

Figures 7 and 8 show embodiments similar to those of Figures 1 and 6, but with the difference that the supporting profiles 1a and 1a' respectively provided there have a square cross-section and, for this reason, the end disks 5a placed on the end side also have a square construction. In this case, the supporting profile

1a' is provided with smaller dimensions. Otherwise, the construction of the joint itself corresponds to that of Figures 1 and 2 or to the further development according to Figures 5 and 6. It is also possible to combine the end disks 5a or 5a' having the square cross-section by way of a joint (disks 9) with end disks 5 or 5', so that also supporting profiles 1 or 1' with a round cross-section can be mounted in an articulated manner on supporting profiles 1a, 1a'.

Figure 9 shows an arrangement in which two supporting profiles 1 with a round cross-section are fastened in a horizontally aligned manner on a vertically aligned supporting profile 1 which takes place in known fashion in that a turnbuckle is inserted into the center chamber 23 with a rectangular cross-section of the adapter piece 3 (Figure 4), which turnbuckle, as described, for example, in German Patent Document DE-U 298 21 204, is used for fastening the horizontal supporting profiles 1 to the grooves 2 of the vertical supporting profile 1. In order to avoid that the plane faces of the horizontal supporting profile 1 joined to the curvature of the vertical supporting profile 1 leave open an unattractive wedge-shaped space toward the outside and, as a result, are also not fastened in a sufficiently stable manner, according to Figures 10 to 12, an end disk 24 is provided which is constructed as a formed body with a concave curvature 25. As illustrated in Figures 11 and 12, this end disk 24 has a central opening 26 for the guiding through of the above-mentioned turnbuckle and, on both sides of this opening, respective openings 27 through which the screws can be guided which then, as mentioned above by means of Figure 4 for the end disks 5, can be screwed into the openings 7 of the adapter piece 3. In this manner, the end disk 24 can be fixedly connected with the assigned supporting profile 1.

However, it was found that such a fastening by means of screws is not absolutely necessary if the turnbuckle is slid in the above-mentioned manner into the supporting profile with the placed end disk 24. The reason is that the turnbuckle, which is then axially anchored in the adapter piece 3, in the case of a corresponding construction, can also interact with the opening 26 as a stop and in this manner can hold the end disk 24 on the face of a supporting profile 1 without the requirement of special fastening operations by means of screws. If the supporting profile 1, which in the embodiment according to Figure 9 is aligned horizontally, is anchored by means of the turnbuckle in the groove 2, as a result of this fastening operation, the concave recess 25 of the end disk 24 constructed as a formed piece and the latter, in turn, are pressed firmly against the face of the supporting profile 1 and secured. Naturally, it would also be conceivable here to provide end disks 24 with a square cross-section so that also supporting profiles 1a, 1a' with a square cross-section can be connected in a perpendicular manner to supporting profiles 1, 1' having a round cross-section.

Figures 10 and 12 also outline another variant. A sleeve-shaped attachment 28 is illustrated by a broken line which may be part of the end disk 24 and which permits the securing of the end disk 24 on the face of the assigned supporting profile in a manner known per se by means of screws laterally introduced in the sense of the dash-dotted lines 29 in Figure 10.

The construction according to the invention therefore opens up variation possibilities for combining supporting profiles which can be utilized particularly in constructions for fairs, exhibitions or stores for new structural variants.